

Capability Gap Analysis

Environmental Quality/Installations

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Executive Summary

In one of its four business areas, the U.S. Army Engineer Research and Development Center (USA-ERDC) conducts research and development in environmental quality and installations (EQ/I). The overall EQ/I program includes both applied research (labeled by the Army as 6.2) and a wide range of services to help infuse technology into Army installations and provide technology support. The program results in new or improved capabilities that help military installations provide and maintain quality training lands and facilities for soldiers and their families.

Since the Army is faced with increasingly scarce resources in the EQ/I area, it is imperative that the program invest funds to develop the new or improved capabilities that are of the highest priority to the Army in its drive to achieve future goals. In particular, it is vital to update the EQ/I program plan and keep it strongly linked to the Army's future needs for capabilities. Given the rapid changes currently underway in the Army, this is a difficult challenge.

To help meet this challenge, ERDC initiated work in December 2003 to strengthen the alignment of its EQ/I R&D program with the latest Army Strategic Planning Guidance. Source documents for this effort were:

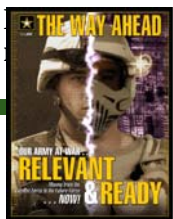
- *The Way Ahead* (An Overview of the Army Strategic Planning Guidance)
- *The Army in 2020* (White Paper)
- *Installation as Our Flagships* (Briefing on CSA Focus Area).

A key step in the alignment process is to identify the capabilities needed by the Army to reach its future goals. To help with this, individuals from throughout the Army were invited to a workshop held on 16-17 March 2004. About 60 participants attended from the organizations listed in the table below.

Organizations with Participants at EQ/I R&D Strategic Planning Workshop 16-17 Mar 2004

ACSIM HQ
IMA HQ
TRADOC Futures Center
AMC HQ
3rd US Army
OSD
DCSOPS
Army Environmental Policy Institute
Army Environmental Center
USACE HQ
USACE NWD Regional Liaison
USACE NAD Regional Liaison
ERDC MANSCEN LNO
ERDC EL, GSL, ITL, CERL, PIO

After reviewing recent Army Installation Strategic Planning guidance and being briefed by stakeholders on their perspectives of the Army's goals, the participants developed prioritized capability gaps associated with meeting the goals. This document includes the "raw" (unedited) gaps. The next step is to assimilate the workshop results into the EQ/I R&D Strategic Plan in coordination with proponents. As recommended by workshop participants, ERDC expects to repeat this process once a year to keep the program in strong alignment with Army goals.



Introduction: The Installation of 2020 – From Home Station to Foxhole

In the February 2004 issue of *Army*, BG David A. Fastabend of the TRADOC Futures Center points to one challenge that may in fact be the primary driver of change for Army installations during the first decades of the 21st century. Throughout our history, says BG Fastabend, geography and the general international order have allowed the Army “to focus on the post-deployment, sustained dimension of our mission.” As shown most infamously by the September 11 terrorist attacks, he asserts that, “in this globalized world, our geography is no longer protection, and we must deploy rapidly — and fight immediately — to deter and defeat our adversaries.”

BG Fastabend’s article, entitled “Adapt or Die,” argues that all Army personnel must promote a culture of continuous adaptation to move the Army toward its vision for 2020 and beyond. That vision was most recently articulated in a white paper entitled *The Army in 2020*. Often referred to as *Army 2020*, the self-described “think piece” broadly outlines changes in doctrine, organizations, training, materiel, leaders and education, personnel, and facilities (DOTMLPF) that senior leaders believe are necessary to transform the Army toward greater relevance and readiness for threats of the 21st century.

Army 2020 describes a vision of installations as “home stations” for active, guard, and reserve forces, hosting key joint defense functions, including combat preparation (training), operational control, force projection, and continued support of military units and their families. GEN Schoomaker, CSA, envisions home stations as the Army’s “flagships” which, through agile logistics and always-on networking, will reach “from home station to foxhole” as a matter of daily routine. To integrate training and operations into daily life, increase unit cohesion, and improve continuity for soldiers and their dependents — all of which are core goals for the future home station — today’s Army installation must be re-conceived in ways that border on revolutionary.

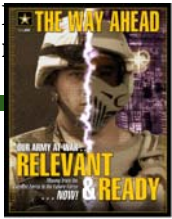
Army leadership will look to the greater installations community (ACSIM, IMA, USACE, and others) to infuse substance into the general vision expressed thus far and align its plans with the latest guidance. To start this process for its plan in the Environmental Quality/Installations (EQ/I) business area, ERDC reviewed the latest Army Strategic Planning guidance and identified six foundational concepts that define the roles and functions of future installations as follows:

- Combat preparation and sustainment support
- Home station operations centers
- Information hubs and sensor nets
- Joint power projection platforms
- Installation and community protection
- Sustainable Installations as holistic communities.

ERDC organized a workshop with participants from throughout the Army and offered these concepts for discussion and critical evaluation. The participants reviewed recent Army Installation Strategic Planning guidance in a “read-ahead” package and were briefed by four stakeholders on their perspectives of the Army’s strategic plan and the installation goals set by the Army.

Breakout groups were formed in the six areas listed above. In the first set of breakout sessions, the participants identified and ranked challenges that lie ahead in meeting the Army’s installation goals. In the second set of breakout sessions, the participants then developed prioritized capability gaps associated with meeting the goals. Those gaps are included (unedited) in this document. Note that workshop participants were not constrained to gaps that could be filled by research; hence some of the gaps may be filled by using existing technology, implementing policy changes, or by taking some other non-research action.

The descriptions of the goals, contrasts of current state vs. future state, and capability gaps that follow are offered to promote candid dialog and innovative thinking. The next step is to work with proponents to assimilate the workshop results into the EQ/I R&D Strategic Plan.



Breakout Group 1: Combat Preparations and Sustainment Support

A. Goals

The 2001 Quadrennial Defense Review recognized that transformed training is the key to achieving the operational goals of the DoD transformation. The DoD's vision for training transformation is to:

Provide dynamic, capabilities-based training for the Department of Defense in support of national security requirements across the full spectrum of service, joint, interagency, intergovernmental, and multinational operations.

The Army transformation in this connection is expressed in two core competencies:

1. To train and equip soldiers and grow leaders
2. To provide relevant and ready land power capability to the Combatant Commanders as part of the joint team.

A training fundamental known to every soldier is that "we must train as we fight." Army leadership affirms that "no soldier can survive in the current battlespace without constant training in weapons and fieldcraft."

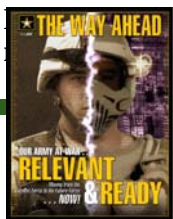
These realities require that training requirements to prepare and sustain the military combatant change dramatically. In the near future, joint and combined arms training centers will be digitally enabled. Advancements in systems interoperability will make non-contiguous maneuver areas the norm. Digitally enabled training facilities and equipment will provide soldiers, units, and command staffs with the flexibility to train from geographically separate locations in a synthetic environment thereby optimizing training opportunities and increasing readiness. Compared with current training facilities, joint training centers (JTCs) will provide unique capabilities. JTCs will be used on rotation to conduct integrated live-virtual-constructive training for com-

bined arms and collective training tasks, as well as to support individual training. JTCs will be linked to institutional support activities to expand training capabilities and opportunities. The nature of training and the associated requirements to sustain training lands and ranges where training will occur will change profoundly.

Using the combined capabilities of installations, units will train, alert, deploy and employ where most operations are performed — at or near the home station.

Technologies such as networked communications and directed energy weapons are already drastically changing facility and infrastructure requirements, and will continue to develop rapidly. Fully modernized installations no longer require large maintenance and repair facilities as all off-system repairs are focused on returning line replaceable units and assemblies back to supply for redistribution. Vehicle and equipment condition are monitored through onboard prognostics. Diagnostics are backed up by Performance and Distributed Based Logistics operations. Two-level maintenance and repair-by-replace methodologies have re-defined sustainment operations to make them both service- and supply-oriented. The same network is used to provide asset visibility and anticipatory support from National Maintenance and Supply Centers.

The installation will continue to support the commander through the HSOC while simultaneously supporting and sustaining the mobilization of forces deployed within CONUS, for operations that will include homeland defense operations. Regionalized sustainment will complement regional installation master planning, and will enable global support.



B. What's the Difference

Summary: What's the Difference		
Area	Current State	Future State
1. Inadequate Land Mass for Joint Training	Land mass for training adequate today if work arounds are applied to selected restrictions and constraints	Adequate land incorporating improvement in combined scheduling, rotational scenarios, and virtual training
2. EQ Regulations & Understanding Impacts	Current approach favors a compliance posture to deal with environmental regulations on a "must fund" basis	Advanced understanding of weapon systems impact and land capabilities to project, plan, and schedule activities in a pro-active manner
3. Integration of Logistic/Maintenance Management & Training with UA	Forward deployed forces require significant logistical and maintenance support resulting in too great a footprint.	Increased flexibility and mobility not tied to a log train and just-in-time end item support.
4. Communications	Dynamics of on-post, off-post, and regional land use and cooperation are reactive and do not allow for flexibility.	Land use collaboration based on predictive technologies and enhanced awareness and communication.

C. Gaps

Area #1 Gaps: Inadequate Land Mass for Joint Training

1. Understanding existing space
2. Method to see, model, simulate joint assets & attributes
3. True integration of C-V-L Training
4. Definition & acceptance of simulated training
5. Smart system that can adjust to land use
6. How to design configurable training facilities
7. How to leverage other agencies' efforts.

Area #2 Gaps: EQ Regulations and Understanding Impacts

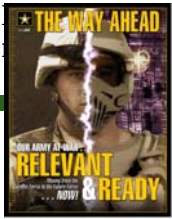
1. Understanding the environmental impact of new weapons
2. Inability to monitor environmental effect at range level
3. Speed up MILCON process
4. Understanding health effects of new weapons, training
5. Base Line data (air/water/land)
6. How decrease national resource requirements
7. How does pollution prevention help
8. Cumulative impacts
9. How do NEPA
10. How come up with metrics
11. Smart system that can adjust to land use.

Area #3 Gaps: Integration of Logistic/Maintenance Management and Training with UA

1. Understanding Joint Training Requirement
2. Standardization of training and support
3. How develop private/commercial support structures that don't promote encroachment
4. Joint logistics and maintenance
5. Jack of all trades soldier
6. Lack of quality in-theater data to construct training areas
7. Move toward hydrogen fuel
8. How to recycle electronics
9. Next generation batter technology
10. Facilities/equipment to meet future force
11. How do we train/deploy safely
12. How decrease downtime back to CONUS.

Area #4 Gaps: Communications

1. How do we build consensus among non-existent stakeholders
2. Smart system that can adjust to land use.



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Breakout Group 2: Home Station Operations Centers

A. Goals

Installations will serve as Home Station Operations Centers (HSOCs) in the global information grid to provide command, control, and support to deployed forces throughout the battlespace, and across the full spectrum of operations. HSOCs will be information hubs, providing seamless connectivity and interoperability that extend the Combatant Commander's "reach" to the unique capabilities of knowledge centers or centers of excellence.

Under the *flagship* concept of home stations, Army, Navy, and Air Force installations will function as command centers with a global reach. Installations will provide "reach" capabilities necessary to simultaneously link deployed forces with Home Stations and to link installations within a region.

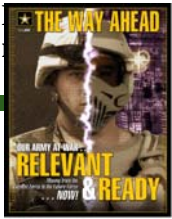
Installation Information Infrastructures (I3) will be sized to meet the challenges associated with transmitting vast amounts of information via fiber

optic or wireless technology. This connectivity to joint, multinational, and interagency centers will facilitate real-time collaboration, and distributed training (live, virtual, constructive training, on an individual through collective basis). These same reach capabilities will provide the necessary connectivity to enable anticipatory logistics support and increased technical expertise for units—whether at home station or deployed.

HSOCs at Unit of Employment (UE) installations will be critical to reducing the deployed footprint. They will be staffed 24 hours a day to meet operational requirements, and to collate and disseminate commanders' critical information. The HSOC will convert information into a situational understanding that will facilitate battle command and function through all phases of an operation. In light of this new installation mission, a number of new force operating capabilities are likely to emerge.

B. What's the Difference

Summary: What's the Difference		
Area	Current State	Future State
1. Network Connectivity	Mostly used for administrative purposes	Part of combatant Global Information Grid Ultra-high bandwidth and reliability requirements
2. Installation Security	Far from the front Terrorist threat demonstrated	High value target Asymmetrical threat New CBRNE? Threats Critical Infrastructure
3. Facility Infrastructure Requirements	Requirements evolve slowly Rigid Division/Brigade structure Fixed Facility functionality	24/7 Command Post Modular Force Structure with embedded assets Facilities adapt to rapidly evolving and varying missions



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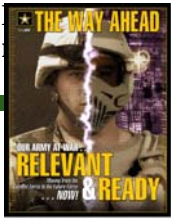
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C. Gaps

It is anticipated that NETCOM will address issues of bandwidth and cyber-security. However, the physical infrastructure to support highly reliable network communications is not in place. Installations lack the means to fully test critical infrastructure, both on and off the installation.

Breakout Group 2 used a nominal group technique to vote on the highest priority capability gaps. The results (where the numbers represent the number of votes) were as follows:

- 10 Lack Modular technology to meet HSCO requirements – Not flexible enough
- 9 Construction cycle and deployment cycle mismatched – Facility aspects don't appear early enough in development/deployment mix
- 3 Lack HQDA Proponent for HSOC funding
- 2 Cannot deliver large # of facilities in 3-4 months
- 1 Don't know HSOC installations or the order in which they will receive them.



Breakout Group 3: Information Hubs and Sensor Nets

A. Goals

The installation-based HSOC will provide a common operating picture between the units involved in specific military operations, will operate integrally with information hubs, which will monitor a full range of installation operational variables and will become critical nodes in the global information grid.

Installations will provide networks of sensors and connected data, diagnostic tools, and decision aids to support intelligent installation operations. The use of emerging and advanced sensor and detector technologies, and intelligent diagnostics will enhance the security posture of the installation without resorting to an “entrenchment” or “walled

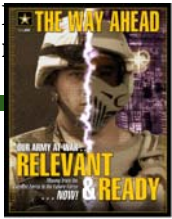
city” environment. Networked, integrated environmental and security sensors, including ground- and satellite-based sensors, will provide comprehensive views of installation conditions and of critical routes and assets beyond the fence line.

Information hubs will integrate these technologies to provide services for installation security and for installation operations such as combat preparation, force projection, operational condition assessments, and emergency response (and other base operations). Information hubs will also serve as regional information centers for homeland security.

B. What’s the Difference

The workshop participants developed a summary of the change in the installations in this area. The table below lists a summary of the change from the current state in the Army (2004) to the Future State envisioned in the Army Strategic Planning guidance.

Summary: What’s the Difference		
Area	Current State	Future State
1. Network/Sensors	Networks Stovepiped and domain specific, with integrating components; sensors limited configuring and cross-sensor communications;	Comprehensive, configurable, reliable, intelligent, flexible, evolving network
2. Info Processing and Delivery	Systems serve specific purposes, humans provide interface when determined needed. Limited automated analytical capability	Purposeful (and automated) data filtering, self-evaluation, routing and connectivity and delivery
3. Info Management	Data is isolated but progress with metadata and data assurance, lots of human interaction required to find what’s needed across domains	Self-documenting and context aware response aids (actions?)
4. Concept/Plan	Lots of stovepiped approaches to data acquisition and delivery; cultural constraints; short term planning – some sustainability/security (stretched horizon) efforts	Requirements shape sustainable, evolving, multi-scale planning that shape network and info delivery architecture; business process defined, implemented and sustained



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C. Gaps

The sensor fusion required and described in TRADOC PAM 525-66 indicates several desired capabilities relevant to the installation hubs and sensor net goals, focused on the overall standard to “see first, understand first, act first, and finish decisively.”

Breakout group 3 identified the follow capability gaps associated with meeting the Army’s goal in this area:

Area #1 gaps: Network Sensors

Optimal Sensor Combinations to meet priority information requirements.

Area #2 Gaps: Info Processing and Delivery

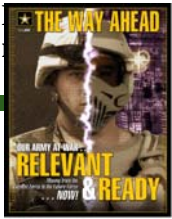
1. Data fusion, self-awareness (data/network), auto agents
2. Evolving and comprehensive approach to human/data interface.

Area #3 Gaps: Info Management

None (no gaps were identified).

Area #4 Gaps: Concept/Plan

1. Common Sense of Purpose/Business Processes Development
2. Joint Requirement for Installation Operating Picture.



Breakout Group 4: Joint Power Projection Platforms

A. Goals

The Future Force must be prepared to respond to a diverse, changing series of asymmetric threats from a wide range of adversaries — separatist movements, religious radicals, adversary nation-states, etc. To respond to these threats, DoD will employ joint/multi-functional basing strategies to support a wide variety of combat unit deployment configurations. Simultaneous deployments from multiple sites provide unprecedented deployment agility and responsiveness to execute a myriad of missions across the full range of military operations. Installations must be flexible enough to align their military and civilian assets to support this highly dynamic, joint, and expeditionary mindset.

Army units will shift from a fixed-scenario threat focus to a rapid-learning capability focus.

Joint power projection platforms (JP3) installations must be able to rapidly shift combat units from peacetime status to war-fighting status, to operate continuously and routinely to support unit rotations and unit manning, training, deployment, and recovery. For the Army, the goal is to deploy a combat brigade in 96 hours, a full division in 120 hours, and five divisions in 30 days. Future Force combat brigades (the effective unit configura-

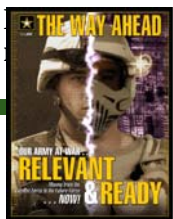
tion) will then quickly engage the enemy and function at high operating tempo, around the clock, for 3 days without re-supply.

JP3 installations must have the classes and quantities of supplies on hand to support combat units immediately upon arrival in theater. Combat service support will use a predictive, highly coordinated, just-in-time multi-modal delivery system to reduce the amount of forward-deployed equipment and materiel. Installations will coordinate combat unit embarkation to highly mobile debarcation stations with pre-positioned equipment and materiel depots to provide seamless combat service support and materiel.

Unit deployment activities will be closely connected with the information hub and combat preparation/sustainment support areas. JP3 installations will draw information from the information hub to plan where and how to deploy units, and to plan for unit re-supply and equipment sustainment. JP3 installations must be able to draw near-real-time information for situational awareness about the evolving mission. Units will prepare for operations via a live-virtual-constructive training environment that enables dynamic mission planning and operation rehearsal.

B. What's the Difference

Summary: What's the Difference		
Area	Current State	Future State
1. Infrastructure	Infrastructure that is aging and relatively fixed, static, and linked to unit's home station unit requirements. Unknown or limited capacity of infrastructure and long lead time for construction and retrofit to meet mission requirements. Limited flexibility.	Flexible infrastructure that can adapt to unit rotations and throughput to meet changing mission requirements. Inventory capability, condition, and status is continuously monitored and upgraded to meet changing needs in the required time frame.



Environmental Quality / Installations

Summary: What's the Difference		
Area	Current State	Future State
2. Environmental	Moderate to inadequate information on environmental hazards and risk at home station and in-theatre, respectively. Processes result in waste generation and build up. Limited or non-existent capabilities for hazardous waste remediation and reduction.	Hazard and environmental planning integrated into planning and operational processes. Expansive waste reduction methodologies for reuse, recycle, and multiuse of materials – home station and in-theatre. Field expedient remediation technologies available.
3. Logistics	Forces in theatre require large logistical footprint and long supply train with significant storage and warehousing requirements. Long-lead times for material replacement and deployment.	Improved processes for packaging, transport and issue of end items with just-in-time delivery to reduce logistical footprint. Maximization of shelf life and use of indigenous materials incorporating adapt-on-the-fly recycle and reuse technologies.
4. Phased Installation Buildup	Inability to properly quantify, plan, design, and package "field expedient installations." Continuous debate over the need, phasing, and resourcing of facilities along the base camp continuum. In-theatre combat units constantly on the move. Combat support services have difficulty keeping up.	Various phases of base camp operations fully planned in a Tactical Master Plan. Installation build up accomplished with flexible, relocatable multipurpose facilities that are field expedient. All material requirements for forward deployed installation facilities and camps are "shrink wrapped" to fit need in support of expedient construction and transition.
5. Training	Training assets to support deployment inadequate for optimizing throughput to meet Army and joint requirements. Deployment requirements not adequately understood or known in asymmetrical threat environment. Limited flexibility to expediently put lessons learned in place and support "reach back" requirements. Limited capability to support deployments from multiple locations.	Training assets continuously assessed and modified to meet threat and throughput requirements for deployment. Linked, embedded training that captures real-time lessons learned and is used to modify constructive and live fire training at home station. Capability to support seamless training and deployment from multiple locations. Civilian workforce fully engaged in deployment actions to include support and active deployment.
6. Cultural Processes (Joint)	Cultural differences between Services and active and reserve components often prohibit seamless deployment integration. Especially relevant in the case of sharing real property assets.	Joint field manuals, methodology, and process that provide multi-service/multi-functional installations. Common warrior ethos instilled throughout entire DoD workforce and contract support.

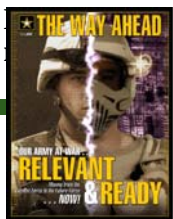
C. Gaps

Breakout group 4 identified these capability gaps associated with achieving the Army's JP3 goals.

Area #1 Gaps: Infrastructure

- Process and tools to determine requirements and analyze current inventory for accuracy and suitability
 - Validate and understand what we have in terms of facilities, as it would apply to the future

- Process to determine facilities to support particular mission types, i.e., facilities required for UA
- Process to determine facilities requirements needed in unique deployments
- Process to determine suitability for particular building to support a mission requirement
- Process to show how condition impacts mission.



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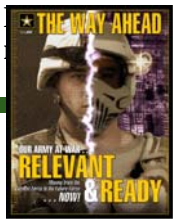
2. Rapid facility rehab and upgrade
 - Condition monitoring for critical deployment facilities and infrastructure
 - Critical facilities risk analysis in deployment situations – modeling and training for alternative courses of action
 - Modifiable buildings by design (criteria for buildings).
3. Hot cargo facilities
 - R&D for hot cargo loading
 - Moving about an installation
 - Building hot pads for storage and breakdown
 - Moving outside installation.
4. Planning criteria for stationing UA/UE
 - Planning for UA/UE locations
 - Facilities friendly – current MILCON process is too long for proposed speed of change (transformed MILCON process).
5. Modifiable facilities.
6. Just-in-time facilities.
7. Modular ports
 - Condition monitoring for in-theatre facilities and infrastructure
 - Rapid repair techniques for in-theatre facilities and infrastructure
2. Remediation technologies
 - Ecosystem rapid recovery methods
 - R&D for fuel remediation in a combat zone
 - What can be sprayed and forgotten
 - Field expedient remediation technology.
3. Lack of policies and procedures
 - Do we have approval policy/procedures for clean up?
 - Updating standards/regulations for current situations.
4. Baseline surveys
 - Baseline surveys with Nation Building in mind
 - Cleaning up our mess vs. cleaning up theirs.
5. Environmental impact reduction methods include:
 - a. Reuse
 - b. Recycle
 - c. Multiuse
 - d. Onsite material (indigenous)
 - e. Extraction of waste
 - Recycling (portable unit – cardboard, plastic, wood, metals)
 - Shipping materials design for: A. multiple/flexible uses in-theatre or B. easy return shipping or C. disposal on-site
 - Use of indigenous material to reduce logistical burden – environmental factors must be considered
 - Logistical system for prepackaged POL (Push Package) and retrograde of hazardous waste – air mobile
 - Move (new) efficient technologies for HW/SW disposal (reuse/recycle technologies)
 - Portable solid waste incinerators – energy recovery
 - Use oil for energy recovery – portable units – DoD approval.

Area #2 Gaps: Environmental

1. Lack of assessment tools
 - Rapid low logistics method to determine site and facility environmental hazards in-theatre
 - Better planning tools that incorporate environmental considerations – pre-deployment and deployment and return to home station – short term vs. long-term – Congressional ???
 - Integrated site selection software that includes environment
 - Site selection planning process (GIS, CHPPM, current intel) – early on maximum base comprehensive plan
 - Small unit test kits for hazardous conditions (PCB, asbestos, etc.)
 - Portable assessment tools to assess hazards/building conditions
 - No remote capability to determine environmental hazards – in-theatre both before deployment, during, and after.

Area #3 Gaps: Logistics

1. Smart warehouses
 - Right types and quantities of warehouses
 - Roboticized packing – roboticized pallet moving
 - Process to rapidly determine prepackage ammo/supply sets for rapid deployment
 - Process/facility to store, prepackage ammo/supply sets for rapid deployment



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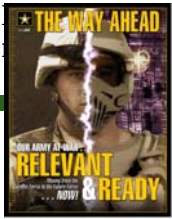
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- Process/facility to rapidly issue ammo/supply sets for rapid deployment
 - Process/facility to rapidly combat load ammo/supply sets for rapid deployment
 - Process/facility to rapidly ship ammo/supply sets for rapid deployment methodologies or process to address shelf life issues
 - Process to provide resupply (prepackaging)
 - Process to reconfigure resupply loads.
2. Reduction of in-theatre logistical footprint
 - Modular construction systems (flexible for various units deployed)
 - Light-weight construction materials
 - Multiuse design of packaging/crating materials
 - Technologies/methodologies for recycle/reuse to reduce logistical burden and footprint
 - Ability to construct using only indigenous materials
 - Determine what indigenous material can be used and how they can be used to reduce logistic burden without negative impact on local area
 - Ability to minimize the weight of expedient construction for transport then maximize using in-country materials
 3. Increasing product shelf life
 - Increase shelf life of components to facilitate more warehousing
 - Supply chain issues
 - Providing for initial issue and reissue in theatre
 - TTP to transition goods from supplier to troops w/o threatening their security
 - No simple way to reduce logistics overhead and still deliver lethal capability
 - Supply rotation using other government agency requirements
 - Once we start the supply chain, is there an end game? Quantity may depend on level of intensity of UA/UE and length of sustainment (expandable supply chain)
 - OCONUS JP3 logistics
 - a. Support of Host Nation (SOFA)
 - b. Indigenous supplies – do they match need of UA/UE? (e.g., Central Europe – Hungary, Romania, Poland)

4. Utility technology – better power generation methods

Area #4 Gaps: Phased Installation Buildup

1. Tactical Master Planning
 - Tactical master planning
 - Organized growth planning
 - Installation in a Box – Inability to properly quantify, plan, design, and package field expedient installations. Who has the mission (IMA/MC)?
 - Sizing of facility as related to mission (see infrastructure gaps).
2. Materials
 - Retrofit technologies
 - Design for different climates
 - Relocatable facilities
 - Installation in a Box – develop materials that can withstand the challenges of multiple climate/environmental scenarios.
3. Facilities
 - IIB - Ammo storage – log/container sorting area
 - IIB – end state – max size (UA, UE, Corp-C5TF, TSG, Army)
 - IIB – Helicopter pads, wash racks, sterile areas, MWR, AAFES.
4. Phase management
 - Establishment of phases – criteria
 - Design logistic materials/systems for turnover to occupied nation
 - Transition planning.
5. Mitigation technologies
 - IIB – Traffic control signs/barriers/dust palliatives
 - Environmental risk reduction techniques.



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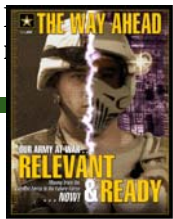
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Area #5 Gaps: Training

1. Training resources
 - Deploying units taking equipment with them – none left for reserve units.
2. Assessment tools
 - Joint training facility assessment tools.
3. Civilian training for deployments
 - Civilian career development to mirror war-fighter training – more joint training/understanding
 - Simultaneous deployment training for military and civilian staff
 - Civilian vs. military training resources and importance.
4. Train as you fight
 - Multiple-site coordination
 - Deployment as part of training.
5. Applying lessons learned from training and execution
 - Linked, imbedded training that captures real-time lessons learned – can be used to modify constructive and live fire as home station.

Area #6 Gaps: Cultural Processes (Joint)

1. Joint FMs
2. Training in joint methodology and processes
3. Stationing to create multiservice/multifunctional installations – team building to dissolve differences
4. Instill warrior ethos into civilian workforce as a way of life and employment



Breakout Group 5: Installation and Community Protection

A. Goals

The Army depends on, and will continue to reach out to local and regional service providers for utilities (e.g., water, sewer, electricity, natural gas). Installations require these critical assets and other community resources such as local fire protection/emergency rescue, telecommunications, transportation infrastructure, and flood control systems. These and other assets critical to installations and surrounding communities require effective protection from a broad range of threats (e.g., natural hazards, terrorism, biological hazards, or network hacking).

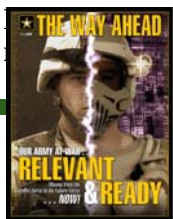
HSOCs at select installations are battle command assets with global reach. The information they provide will demand especially high levels of security using advanced technologies (e.g., biometrics, smart cards, entity tagging and tracking,

networked sensors, smart CBRNE, and weapons/munitions detection capabilities). Security procedures and capabilities should be linked to local, State, and Federal law enforcement activities to enhance inter-agency responsiveness and to increase survivability.

The use of emerging and advanced technology such as sensors and detectors will enhance the security posture of the installation. These improvements will also protect against and respond to natural hazards including corrosion, storms, earthquakes, fire, and flood. The protection and security of critical assets will extend beyond the physical boundaries of the installation to include the local civilian community and associated centers of excellence.

B. What's the Difference

Summary: What's the Difference		
Area	Current State	Future State
1. Scope of Army's Protection and partnering	Limited to physical boundaries of installation; the Army assumes most of the burden of protection.	Extends beyond installation boundaries to include local communities and key assets (including mission-critical utilities); there is a strong partnership with community and regional organizations.
2. Installation Security Strategy	Primary focus is on access control using security guards and fences around physical boundary of installation; this "fortress" approach inhibits integration of installation with local community. Strategy is mostly based on adherence to standards and qualitative vulnerability assessments.	Multi-faceted strategy that incorporates advanced sensors and sophisticated technology that enhances security but reduces barriers to integration with local community. A customized strategy is developed for each installation based on results from modeling and simulations of the specific installation with forecasted threats.
3. Threat and Vulnerability Assessment	Assessment is done primarily through manpower-intensive inspections by teams using qualitative methods to estimate vulnerability.	Rapid, evolutionary and affordable assessments are performed frequently. Sophisticated threat forecasting techniques are employed to identify future threats and generate scenarios. The scenarios are used in modeling and simulation tools to test vulnerability and enhance the security strategy.



Summary: What's the Difference		
Area	Current State	Future State
4. Access Control	Access control is employed at the physical boundary of installation using fences and security guards; this is expensive and leaves major areas vulnerable.	Installation is zoned according to the level of security required. Access control is primarily accomplished through smart cards and biometrics, result in much higher level of security. Only small portion of installation with critical facilities (e.g., HSOC) requires fencing and security guards.
5. Installation Utilities	Most utilities are vulnerable to even the simplest attack method (e.g., a grenade or stick of dynamite).	Vulnerability of utilities is reduced through strengthened design, backup and alternate sources, and electronic systems. Electronic systems incorporate sensors that provide real-time monitoring and control for rapid response to threats. Installations are provided with secure, reliable and uninterruptible power sources.

C. Gaps

Breakout group 5 identified the following capability gaps for the Army's goals set for Installation and Community Protection.

Area #1: Scope of Army's protection and partnering

- Plan for installation and community protection through social, political and economic coalitions
- Ability to manage and coordinate information among multiple partners.

Area #2: Installation security strategy

- Modeling and simulation (prioritization methods)
- Identification of future threats and means to deter/defeat (i.e., cyber/lasers, etc.)
- Force protection SOPs (joint/communities) for use by all installations

Area #3: Threat and vulnerability assessment

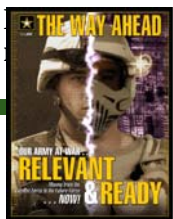
- Modeling and Simulation
 - a. Fusion of sensors and data into real-time modeling and simulation
 - b. System diagnostics
 - c. Standardization criteria/protocols
 - d. Countermeasures/automated response

Area #4: Access control

- Orchestrate community and installation threat response

Area #5: Installation Utilities

- Future needs development of secure power management
- Decision support systems for energy management
- Standards and operating procedures for power generation and distribution



Breakout Group 6: Sustainable Installations as Holistic Communities

A. Goals

Army installations are and will continue to be embedded in regional environmental and social contexts. More effective integration with surrounding communities will be necessary for installations to accomplish missions of continuous training, power projection, and seamless interoperability with deployed formations.

The Army has two simultaneous goals for achieving the vision of installations as holistic communities:

1. Environmental strategies, land use, and stewardship activities will be fully integrated into business processes and base support services, on post and in coordination with state and local governments to achieve mutually supportive objectives that pertain to installation/community interaction.

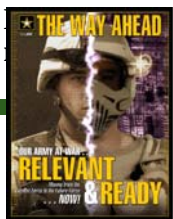
2. Installations and communities will become integrated and thus more mutually supportive. Regional, city, and installation master planners will work together to leverage common infrastructure and services.

One transformation concept that will certainly have a major impact on the shape of future installations is *Force Stabilization*, which will complement a rotation-based system of global engagement. Force Stabilization will directly address the well-being of soldiers and their families by locating soldiers' family units at home stations for extended tours of duty. When soldiers are sent on unaccompanied tours, their families will remain at the home station. At the tour's end, soldiers will return *home*, to family and home station.

B. What's the Difference

The workshop participants developed a summary of the change in the installations in this area. The table below presents a summary of the change from the current state in the Army (2004) to the Future State envisioned in the Army Strategic Planning guidance.

Summary: What's the Difference		
Area	Current State	Future State
1. Regional Community Partnering	General agreement among installations, communities and leadership regarding mutual effects. Solutions are isolated and piecemeal with limited effects metrics and means of communicating lessons learned.	Standard templates for partnering agreements and processes to include: Interests of all parties; Opportunities for synergy; Conflicts; Solutions; Products; Metrics; Resources. Repeatable processes (e.g., expanded JLUS process to include other areas).
2. Installation Business Processes	Systemic problems include PPBES, stovepipes; Failure of perspective (not joint); Intensely bureaucratic (not integrated and inflexible); Short planning horizon (POM); Acquisition piece not integrated with facility. How we think about current inventory (vacant equals excess) – reutilization vs milcon; Don't know what a meaningful indicator is	Co-management of cultural and natural resources; joint and integrated, multi-generational planning, better integration of resource acquisition; stewards NOT consumers; meaningful indicators



Summary: What's the Difference		
Area	Current State	Future State
3. Joint Service Planning	Many of our Army installations are located near air bases, navy and marine facilities that do not utilize or share land and space resources. - e.g., - McCord AFB/Fort Lewis, WA; Pope AFB/Fort Bragg, NC; McGuire AFB/ Fort Dix	Developing a strategic utilization of land and facility assets, taking advantage of potential economies and efficiencies of scale in sharing of facilities, ranges, and exchanging assets. We train and fight jointly, if we used our facilities and land in the same way, we could take advantage of the total asset base.

C. Gaps

Installations as holistic communities will have significantly different patterns of relationship to their neighboring communities and to the environment than they have today. Achieving the twin goals of internal transformation and external integration will depend on the scientific understanding of complex interactions with the natural, built, and social contexts on-post and the natural, built, and social contexts in which the post itself is embedded.

Holistic communities are inherently dynamic, both when they look inward to change business processes and when they engage externally to change old linkages and develop new ones. To achieve the goal of holistic communities envisioned in *The Army in 2020*, all parties will need to engage in informed, joint decision making that is based on the best available scientific data and analyses. They will need to address the gaps identified by the workshop participants in the three areas below.

Area #1 Gaps: Regional/Community Partnering

Current State – General agreement among installations, communities, and leadership regarding mutual effects. Solutions are isolated and piecemeal with limited effects metrics and means of communicating lessons learned.

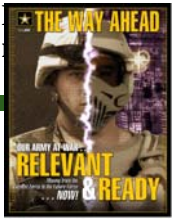
Future State – Standard templates for partnering agreements and processes to include: Interests of all parties; Opportunities for synergy; Conflicts; Solutions; Products; Metrics; Resources. Repeatable processes (e.g., expanded JLUS process to include other areas).

1. Standardized organizational structure to handle community partnering.

2. HQ mandate (SROC?) needed to achieve sustainable installation, environment, and quality of life.
3. How do you ensure that you've engaged the appropriate people from the community and military in the process?
4. Acceptable /enforceable method to choose between competing priorities.
5. Process to engage local communities to envision areas of mutual benefit and development once multi-service training requirements are established.
6. How do we determine who's the responsible agent/agencies for developing a platform and framework for partnering at a regional/community level? Congress? DoD? Etc.
7. Approaches to identify areas of potential mutual benefit tied to ability to compare regional, multi-service assets for achieving training and power projection "landscape."
8. Tools lacking for planning across overlapping virtual communities (robust set of GIS tools).
9. Tools to identify appropriate universal metrics to measure success.
10. List of tools (info, software, etc.) that can be developed to manage impacts and meet needs of all concerned.
11. Develop a general understanding of issues and agendas of both Fort Future and a typical local community.

Area #2 Gaps: Installation Business Processes

Current State – Systemic problems include PPBES, stovepipes; Failure of perspective (not joint); Intensely bureaucratic (not integrated and inflexible); Short planning horizon (POM); Acquisition piece not integrated



Capability Gap Analysis

Environmental Quality / Installations

with facility. How we think about current inventory (vacant equals excess) – reutilization vs. milcon; Don't know what a meaningful indicator is.

Future State – Co-management of cultural and natural resources; joint and integrated, multi-generational planning, better integration of resource acquisition; stewards NOT consumers; meaningful indicators

1. DOD policy to mandate joint utilization of enterprise GIS to meet regional planning goals.
2. DOD policy, incentives, analysis and planning tools to reuse and reconfigure building inventory.
3. DOD policy that mandates local involvement in Army planning processes.
4. Appropriate extended-horizon planning tools.
5. A means of identifying goals and analyzing opportunities and constraints on developing plans for cooperative management of resources.
6. Culture change mechanisms that start in doctrine (from unintegrated, short-term, inflexibility to integrated, long-term, flexible).
7. Gain knowledge of what meaningful sustainability metrics might be.

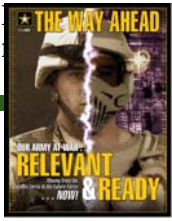
Area Gaps #3: Joint Service Partnering

Current State - Many of our Army installations are located near air bases, navy and marine facilities that do not

utilize or share land and space resources, e.g., McCord AFB/Fort Lewis, WA; Pope AFB/Fort Bragg, NC; McGuire AFB/ Fort Dix

Future State - Developing a strategic utilization of land and facility assets, taking advantage of potential economies and efficiencies of scale in sharing of facilities, ranges, and exchanging assets. We train and fight jointly, if we used our facilities and land in the same way, we could take advantage of the total asset base.

1. Develop service/joint strategy of land and facilities assets, utilization, and management policy for all services (GSA sets policy for all federal, including DoD, on excess and surplus real property. Sharing land resources could be addressed via MOU/MOA).
2. Currently no systematic method to identify all possibilities to be beneficial at either joint or other service level.
3. No common tool to evaluate impact of use of all installations: common metrics, language, and products.
4. Not a current mind set at the service by service level to act jointly in garrison. Considering the fast pace and changing military, the time may have come to change.
5. Lack of knowledge about what type of assets each service possesses and how they could be used for other service use or multi-use.



Conclusions and Future Directions

1. Workshop participants displayed a great deal of energy and generated a large number of capability gaps. It was concluded that the number of gaps was unexpectedly large because of two factors:
 - a. The workshop participants were not constrained to identify only those gaps that could be filled by research
 - b. Some breakout groups were successful in prioritizing the brainstorming results and developing a short list of prioritized gaps. Other groups did not prioritize and hence produced longer lists of gaps. In the aggregate, the end result was a long list of gaps that will be processed by ERDC in coordination with proponents, and that will provide valuable input to the EQ/I R&D Strategic Plan.
2. The large turnout of participants representing a wide range of organizations indicates a substantial interest in—and need for—this type of workshop in the Army community.
3. Workshop participants recommended that this type of workshop be held about once a year, and volunteered suggestions for improvement of future workshops (e.g., facilities that have the correct capacity to handle the number of participants and to support group collaboration tools for breakout sessions).
4. This initial workshop was a pioneering effort; it allowed ERDC to experiment with different techniques to simply “find what works best.” The hands-on experience enabled ERDC to select the best ideas and to generate examples to guide participation in future workshops.
5. The gaps described here are just the starting point for the strategic planning process. ERDC will work with proponents to process the results and update the EQ/I R&D Strategic Plan.
6. The workshop recommendations have been processed into a revised approach and incorporated into an annual EQ/I R&D strategic planning cycle. The current draft cycle proposes to hold the next workshop in late October 2004 in synchronization with the ERDC planning process.



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